UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/536,591	05/27/2005	Robert Mark Stefan Porter	282548US8XPCT	9206

22850 7590 11/28/2007

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
THOMAS, MIA M	

ART UNIT	PAPER NUMBER
2624	

NOTIFICATION DATE	DELIVERY MODE
11/28/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/536,591	PORTER ET AL.	
	Examiner	Art Unit	
	Mia M. Thomas	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 May 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *see attached*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show appropriate contrast and detailed descriptions as described in the specification. Specifically, with respect to Figures 7, 8, 13a-c, 17 a-c, 18, 25, 27 a-b, 29, 30, and 32, the details as presented with this instant application appears in many instances blurred, distorted and unclear. At Figures 17a-c for example, it is hard to distinguish between the disparities as presented. Figure 27 has vague detail; however it appears that the scanning of these drawings may also be deficient. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance. Examiner suggests adjusting the contrast before the scanning of these documents to prevent future transmission problems concerning the scanning of these drawings.

Specification

3. The abstract of the disclosure is objected to because "The sheets or sheets presenting the abstract may not include other parts of the application or other material." For example, references to Figures 22a to Figures 22c, shall not be apart of the formal Abstract as submitted. Correction is required. See MPEP § 608.01(b). Also read 37 CFR 1.72.

4. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

(a) TITLE OF THE INVENTION.
(b) CROSS-REFERENCE TO RELATED APPLICATIONS.
(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
(d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
(e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
(f) BACKGROUND OF THE INVENTION.
    (1) Field of the Invention.
    (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
(g) BRIEF SUMMARY OF THE INVENTION.
(h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
(i) DETAILED DESCRIPTION OF THE INVENTION.
(j) CLAIM OR CLAIMS (commencing on a separate sheet).
(k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).

(l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

- Examiner notes that the arrangement of the specification does not conform to US practice by supplying appropriate labels and heading were necessary; for example, there is no separation of the "Description of the Drawings" and the "Detailed Description of the Invention" (page 3, line 13). It appears that the application was submitted in a formal technical writing style which does not conform with the arrangement as suggested above. Appropriate correction is required.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested:

"Reliable Face Detection Apparatus with Indicative Data Comparison and Processing"

Response to Amendment

6. This Office Action is responsive to Applicant's remarks received on 27 May 2006. Claims 1-14 remain pending in the application. The claims have been amended to eliminate multiple dependencies. Examiner has entered the claim amendments for instant application 10/536,591.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claims 11-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claim 11 defines a computer program, embodying functional descriptive material. However, the claim does not define a computer-readable medium or computer-readable memory and is thus non-statutory for that reason (i.e., "When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized" – Guidelines Annex IV). The scope of the presently claimed invention encompasses products that are not necessarily computer readable, and thus NOT able to impart any functionality of the recited program. The examiner suggests amending the claim(s) to embody the program on "computer-readable medium" or equivalent; assuming the specification does NOT define the computer readable medium as a "signal", "carrier wave", or "transmission medium" which are

deemed non-statutory (refer to "note" below). Any amendment to the claim should be commensurate with its corresponding disclosure.

Note:

> A "signal" (or equivalent) embodying functional descriptive material is neither a process nor a product (i.e., a tangible "thing") and therefore does not fall within one of the four statutory classes of § 101. Rather, "signal" is a form of energy, in the absence of any physical structure or tangible material.

Should the full scope of the claim as properly read in light of the disclosure encompass non-statutory subject matter such as a "signal", the claim as a whole would be non-statutory. In the case where the specification defines the computer readable medium or memory as statutory tangible products such as a hard drive, ROM, RAM, etc, as well as a non-statutory entity such as a "signal", "carrier wave", or "transmission medium", the examiner suggests amending the claim to *include* the disclosed tangible computer readable media, while at the same time *excluding* the intangible media such as signals, carrier waves, etc.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia et al. "Face Detection Using Quantized Skin Color Regions Merging and Wavelet Packet Analysis", pages 264-277-13 July 1999 in combination with Hong et al US (6,819,796 B2).

Regarding (Original) Claims 1 and 10:

Garcia discloses face detection in which an image region of a test image is compared with data indicative of the presence of a face ("...a novel scheme for human face detection in color images under constrained scene conditions...the face image represented as a 2-D array of intensity values is compared to a single or several templates representing a whole face." at pages 264, abstract and right column, paragraph 2; respectively); comprising:
a face detector operable to perform face detection on regions of the test image other than those identified by the pre-processor as low-difference regions (Refer to "DiVan"-Distributed audioVisual Archives Network System, specifically "As a preliminary work, we presented in [17], a face detector which had been developed in order to index a hug amount of video and image data and to cope with high-speed requirements." at page 265, left column, paragraph 2).

Garcia does not specifically disclose (demonstrate) a pre-processor operable to identify low-difference regions of the test image where there exists less than a threshold image difference across groups of pixels within those regions, however,
Hong teaches:
a pre-processor operable to identify low-difference regions of the test image where there exists less than a threshold image difference across groups of pixels within those regions (Refer to Figure 3, numeral 5). For clarity, Hong teaches "a method for segmenting a pixellated image comprising selecting at least one first region from a first reference image." (at abstract) As best understood by Examiner, the pre-processor as taught by Hong is operable to calculate and identify the low-difference regions (i.e. Figure 3, numeral 1b). The explanation for the

identification of low-difference regions of the test image are to be interpreted as this explanation describes for all claims now referring to low-difference regions.

At the time that the invention was made it would have been obvious to one of ordinary skill in the art to add a pre-processor for identifying the low-difference regions as taught by Hong to the face detector as disclosed by Garcia because the pre-processor will "index a huge amount of video and images data to cope with high-speed requirements.", in addition to the application to easily identify the low-difference regions to be analyzed. (Garcia, page 265, left column, paragraph 2)

Regarding (Original) Claim 2:

Garcia discloses an apparatus in which the region is a rectangular region ("In our previous work [17], skin-color filtering was applied on "I" frames at MPEG macro-block level (16x16 pixels), providing a macro-block binary mask which was segmented into non-overlapping rectangular regions containing contiguous regions of skin color marco-blocks(binary mask segment areas)." at page 267, right column, Section III, paragraph 2); the pre-processor operating to identify low-difference regions only with respect to pixels in a central portion of the regions ("Then the algorithm had to search for the largest possible candidate face areas and iteratively reduced their size in order to scan all the possible aspect ratios and positions into each binary mask segmented area." at page 267, right column, Section III, paragraph 2).

Additionally, Hong also teaches the pre-processor operating to identify low-difference regions only with respect to pixels in a central portion of the regions (Refer to Figure 3, numerals 1-18,

specifically, Figure 3, numeral 1-b)

Regarding (Original) Claim 3:

Garcia discloses the face detecting apparatus as shown above.

Although not specifically detailed in the literature associated with this non-patent literature document (Garcia), it is clear that the face detection apparatus is operable to perform the same "regional analysis" as taught by Hong. Hong is used to expressly identify the portions in which the claimed invention points to a central region exceptionally as shown diagrammatically at Figure 6 (Hong).

Hong teaches the apparatus in which the central portion of a region comprises all of the region except for two strips, one at each side of the region (Refer to Figure 6, numeral 7).

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to exemplify the face detecting apparatus as disclosed by Garcia to demonstrate the central portion of a region comprising all of the region except for two strips... as taught by Hong because this allows the user to determine the background and foreground diagrammatically.

Regarding (Currently Amended) Claim 4:

Hong teaches an apparatus according to ~~any one of the preceding claims~~ claim 1, in which the pre-processor is operable to identify high-difference regions of the test image where there exists greater than a threshold image difference across groups of pixels within those regions (Refer to Figure 3, numeral 3 and numeral 5); and a face detector operable to perform face detection on

regions of the test image other than those identified by the pre-processor as low-difference regions or high-difference regions (Refer to Figure 7, numerals 4, 11, 13, 24, 25, 16-18).

Regarding (Currently Amended) Claim 5:

Garcia discloses an apparatus according to ~~any one of the preceding claims~~ claim 1, in which the face detector is operable: to derive a set of attributes from respective blocks of a region ("In the first case, some geometrical measures about distinctive facial features such as eyes, mouth, nose and chin are extracted." at page 264, right column, section 1, paragraph 2); to compare the derived attributes with attributes indicative of the presence of a face ("In the second case, the face image, represented as a two—dimensional (2-D) array of intensity values, is compared to a single or several templates representing a whole face." at page 264, right column, section 1, paragraph 2); to derive a probability of the presence of a face by a similarity between the derived attributes and the attributes indicative of the presence of a face ("A set of simple statistical data is extracted from these coefficients, in order to form vectors of face descriptors, and a well-suited probabilistic metric derived from the Bhattacharyya distance is used to classify the feature vectors into face or non-face areas, using some prototype face area vectors, which have been built in a training stage." at page 265, right column, paragraph 1); and to compare the probability with a threshold probability ("Less false alarms are obtained by using the CMU face detector...By tuning the threshold used for classification according to the prototypes face features vectors, it is possible to control the final false alarms rate..." at page 276, left column, paragraph 2).

Regarding (Original) Claim 6:

Garcia discloses in which the attributes comprise the projections of image areas onto one or

more image eigenvectors ("In the second case, several correlatation templates are used to detect local sub-features which can be considered as rigid in appearance (view-based Eigen spaces [29]) or deformable (deformable templates [034]." at page 265, left column, section 1, paragraph 1).

Regarding (Currently Amended) Claim 7:

Hong teaches an apparatus according to ~~any one of the preceding claims~~ claim 1, in which the groups of pixels comprise pairs of adjacent pixels (Refer to Figure 8; "An object pixel is regarded as inside the object if all its adjacent pixels are also foreground pixels. These adjacent pixels may be defined as the 4-connected neighbors as illustrated at 22 in FIG. 8 or as the 8-connected neighbors as illustrated at 23 in FIG. 8. There is no operation required for object pixels inside the object." at column 20, line 39).

Regarding (Currently Amended) Claims 8 and 9:

Hong teaches a surveillance apparatus, video conferencing apparatus comprising apparatus according to ~~any one of claims 1 to 7~~ claim 1 ("Further possible applications include video communication, video conferencing, television broadcasting, Internet multimedia applications, MPEG-4 applications, face detection applications and real time video tracking systems such as observer tracking auto stereoscopic 3D displays. A specific application of such techniques is in digital video cameras and other digital image capture and recording devices for multimedia applications. An example of such a device is the Sharps(RTM) Internet ViewCam." at column 1, line 16).

Regarding (Original) Claim 11:

Hong teaches computer software having program code for carrying out a method according to claim 10 ("The method may be performed on any suitable apparatus such as that illustrated in FIG. 9. A programmed data processor comprises a central processing unit (CPU) 30 connected to a CPU bus 31. A system memory 32 is connected to the bus 31 and contains all of the system software or program for operating the data processor." at column 21, line 31).

Regarding (Original) Claim 12:

Hong teaches a providing medium for providing program code according to claim 11 ("According to a third aspect of the invention, there is provided an apparatus for segmenting a pixellated image, comprising a programmable data processor and a storage medium containing a program for controlling the data processor to perform a method according to the first aspect of the invention." at column 7, line 51).

Regarding (Original) Claims 13 and 14:

Hong teaches a medium, the medium being a storage medium and a transmission medium. ("According to a fourth aspect of the invention, there is provided a storage medium containing a program for controlling a data processor to perform a method according to the first aspect of the invention." at column 7, line 57).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

US 5,915,044 US 5,878,163 US 6,477,275

US 2001/0000025 US 6,819,783 US 6,526,156

US 6,246,779

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mia M Thomas
Examiner
Art Unit 2624

Mia M. Thomas

VIKKRAM BALI
PRIMARY EXAMINER